

## DISPLAY SCREEN BEZEL AND ASSEMBLY METHOD

### CROSS-REFERENCE TO RELATED PATENT APPLICATION

Reference is made to related U.S. patent application Ser. No. 07/319,528, "Tilt and Swivel Support Apparatus" by Craig Sampson, filed Mar. 6, 1989.

### BACKGROUND OF THE INVENTION

This invention relates to bezel apparatus for a display screen of a display device, and more particularly to a bezel containing an arrangement of radiation emitter and detector pairs for utilization in a touch input computer display system, and a method for assembling the bezel apparatus to the display device.

One type of interactive computer system permits an operator to enter information into the computer by selectively touching points on the screen of a computer monitor or display device, such as a cathode ray tube (CRT), upon which is displayed relevant information. One such touch input system provides an arrangement of radiation emitter and detector pairs, for example a plurality of light emitters (typically in the infrared range) arranged along one vertical side and one horizontal side of the display screen, and a plurality of detectors arranged along the other vertical and horizontal sides. The resulting rectangular arrangement of emitter and detector pairs produces a corresponding light beam grid over the display screen which, when interrupted by the operator's finger or a pointer, permits the touched screen location to be calculated by the computer and data related to the information then displayed at the touched screen location to be entered into the computer.

One manner of supporting the arrangement of infrared emitters and detectors is to enclose the arrangement within a rectangular bezel bordering the display screen or CRT face, the bezel being of a material transparent to infrared radiation and often referred to as a touch screen bezel. The arrangement is fixed within the touch screen bezel such that the emitters and detectors are in predetermined spatial relation to the CRT face when the bezel is in predetermined position in relation to the CRT face. Accordingly, it may be appreciated that the accurate determination of the location of each point touched on the CRT face depends in part upon the accuracy with which the touch screen bezel is positioned upon the CRT face. The mounting of the CRT and the touch screen bezel to the assembly's chassis for producing such accurate positioning, however, is somewhat hampered by the fact that the face of a typical CRT may not have been accurately positioned relative to its mounting points when the CRT was manufactured.

A touch screen bezel is normally mounted to the display system chassis in fixed position determined by the requirement that the bezel be precisely aligned with other housing parts attached to the chassis. When the CRT is mounted to the chassis, the position of the CRT face may be skewed or orthogonally displaced with respect to the precisely fixed touch screen bezel. This problem is typically overcome by adjusting the position of the CRT in the chassis, usually employing a fixture for implementing such adjustments, with the expectation that the bezel will properly seat against the CRT face when the bezel is mounted to the chassis in its fixed

position after CRT position adjustments have been completed. Such mounting adjustments require utilization of additional parts and assembly time, and are subject to error resulting in inaccuracies in the seating of the touch screen bezel to the CRT face.

### SUMMARY OF THE INVENTION

The present invention provides a touch screen bezel assembly which is mounted to a chassis or frame to which a CRT is also mounted, the bezel assembly being fixed in precise relation to other housing parts while being self adjusting to the face of the CRT, eliminating the need for making mounting adjustments to the CRT with respect to the chassis.

Briefly described, the present invention provides bezel apparatus for a display device having a display screen, comprising in combination: a first bezel for the display screen, the first bezel having inner edges describing an opening in the first bezel; mounting means for mounting the first bezel in fixed relation to the display device; a second bezel for being fitted within the first bezel opening, the second bezel having an inner lip with an edge describing an opening in the second bezel, the edge conforming to the contour of the display screen for engaging the display screen; and spring means for cooperating with the first and second bezels for resiliently retaining the second bezel within the first bezel with the second bezel's inner lip edge engaging the display screen when the first bezel is mounted in fixed relation to the display device with the second bezel fitted within the first bezel opening. The first bezel opening is preferably generally rectangular and, when the first bezel is mounted in fixed relation to the display device, the edges describing the first bezel opening border the display screen. The second bezel is preferably also generally rectangular and, when the first bezel is mounted to the display device with the second bezel fitted within the first bezel opening, the spring means urges the second bezel's inner lip edge to engage or seat against the display screen.

The spring means between the inner and outer bezels permits the inner bezel to float with respect to the fixed outer bezel, along an axis perpendicular to the display screen, while the inner bezel's conforming inner lip edge is urged to seat against the CRT face. The inner bezel, which when used in a touch input display system contains a rectangular arrangement of radiation emitter and detector pairs in precise spatial arrangement within the inner bezel for providing a radiation grid in front of the display screen, is accordingly self positioning upon the CRT face, accommodating manufacturing variations between the mounting points and the face of the CRT. In addition, the biasing force produced by the spring means when contacting the outer bezel causes the inner bezel's conforming inner lip edge to be closely maintained against the CRT face, serving to protect the operating components within the inner bezel from dust and other ambient contaminants. In the preferred embodiment of the present invention, the spring means includes two spaced spring devices carried by each side of the generally rectangular inner bezel.

According to the present invention, the method for assembling the bezel apparatus to the display device or CRT comprises the steps of: providing a display device having a display screen; providing a chassis for mounting the display device thereto; mounting the display device to the chassis; providing a first bezel for the